

Patent claims

1. A device for monitoring the flames of oil burners, having a sensor 10, and an amplifier circuit 11 for evaluating the signal 12 detected by the sensor 10, the sensitivity of the amplifier circuit 11 adapting itself automatically to the actual level of the signal 12 detected by the sensor 10, characterized in that a control signal 17 generated by the amplifier circuit 11 is mathematically combined with the signal 12 detected by the sensor (10) in a voltage divider device 13 of the amplifier circuit 11.
2. The device as claimed in claim 1, characterized in that the control signal 17 sets the amplitude of the signal 12 detected by the sensor (10) to the defined amplitude.
3. The device as claimed in claim 1 or 2, characterized in that an output variable 18 of the voltage divider device (13) then successively passes through a filter device 14, a rectifier device 15 and an amplifier device 16, and in that the output signal of the amplifier device 16 is the control signal 17.
4. The device as claimed in one or more of claims 1 to 3, characterized in that the voltage divider device 13 is embodied as an adjustable resistor, and in that the filter device 14 preferably has two bandpass filters 19, 20 connected in series.
5. The device as claimed in one or more of claims 1 to 4, characterized in that the rectifier device 15 comprises a resistor 21 connected in series

with a diode 23, a capacitor 25 which is connected in parallel with each of these elements, and a resistor 26.

6. The device as claimed in one or more of claims 1 to 5, characterized in that the amplifier circuit 11 also has a comparator 30, the comparator 31 comparing the output signal 22 of the rectifier device 15 with a reference value and generating therefrom a flame signal 31 which contains information on the presence of a flame of the oil burner.

7. The device as claimed in one or more of claims 1 to 6, characterized in that a self-test signal 33 which is used for functional checking of the amplifier circuit 11 can be fed to the amplifier circuit 11.

8. The device as claimed in claim 7, characterized in that the self-test signal 33' can be fed to a second voltage divider device 34 which forms an input signal for the filter device 14' therefrom.

9. The device as claimed in claim 7 or 8, characterized in that the second voltage divider device 34 reduces the amplification of a first bandpass filter 18 as a function of a clock of the pulses of the self-test signal 33', the functional checking being permanently superimposed on the actual monitoring of the flames.

10. The device as claimed in claim 9, characterized in that the amplification of the first bandpass filter 18 is divided into three or halved, that is to say is not reduced to zero.

11. The device as claimed in one or more of claims 1 to 10, characterized in that the amplifier device 16 in the amplifier circuit 11 has a proportional integral amplification characteristic.
12. The device as claimed in claim 11, characterized in that the amplification characteristic of the amplifier device 16 is changed to a predefined, sensitive state by a signal 32.
13. The device as claimed in claim 11 or 12, characterized in that the signal 32 for changing the integral amplification factor is activated as a function of setting switching-over operations of the oil burner in multi-setting burner operating mode in order to reliably detect the presence of a flame of the oil burner even during a setting switching-over operation.
14. The device as claimed in one or more of claims 1 to 13, characterized in that the amplifier circuit 11 is integrated into a microprocessor, in particular into a microprocessor-controlled controller.